

Chapter 1: Meridian IVR product overview

What is an Interactive Voice Response (IVR) system?

Interactive Voice Response (IVR) is the generic term given to applications which allow a caller to interact directly with information stored in a computer's database through a touch-tone telephone.

The typical IVR application initiates a predefined sequence of verbal prompts, providing options and instructions to the caller. It allows the caller to respond to these verbal prompts and instructions via the telephone touch-tone keys, as if the keys were on the keyboard of a computer terminal. In this way, information inquiries and transactions can be carried out directly by the caller with no need for additional human intervention or terminal interface.

IVR benefits

The convenience and ease-of-use of IVR systems has led to their rapid acceptance by the general public. The organizations that offer these services have realized labor cost savings, new sources of revenue, and a measure of uniqueness from their competitors through deployment of new or improved customer services via advanced technology.

Northern Telecom (Nortel), a leading edge competitor in the IVR marketplace, continues to integrate new technologies such as fax and data device interfaces and call-screen synchronization CTI technology into the Meridian IVR product. Many companies and organizations expect this level of functionality in new technical products introduced to the marketplace.

Who uses IVR?

Interactive Voice Response can be used by organizations in a number of ways.

All companies and organizations

IVR can be used for the following:

- account inquiries
- customer service
- quotations

Financial organizations

Financial organizations can use IVR so that customers can retrieve up-to-date account information, pay bills, transfer funds, and receive stock quotations.

Health care industries

Health care industries can use IVR to allow customers to inquire about the status of policies, benefits, and claims.

Commercial airlines

Commercial airlines can use IVR so that customers can make inquiries about reservations, arrival and departure times, frequent flyer mileage, and vacation packages.

Educational institutions

Colleges and universities can use IVR for registration, including course selection and availability, and confirmation of admission to a class.

The people within these organizations who are responsible for purchasing an IVR system are usually

- Telecom managers
- Call Center managers
- MIS managers

Meridian IVR benefits

The benefits of the Meridian Interactive Voice Response system include

- improved customer service and satisfaction due to 24-hour access to information with less time spent waiting for a call to be serviced
- reduced business costs because of the decreased need for operators
- accuracy and consistency of information
- system reliability
- potential for increased revenues due to lower labor costs and Meridian IVR's ability to handle a large volume of calls
- customer privacy and confidentiality as the customers interact directly with a computer
- increased employee productivity because Meridian IVR eliminates the need for employees to spend time repeatedly providing routine information

Meridian IVR features

The features common to all Meridian IVR applications are

- administration
- integration with the telephone switch
- data connectivity
- fax processing
- voice processing
- telephony functions

Administration

Meridian IVR can run many different applications at the same time. Using a comprehensive set of administration tools, you can

- configure the Meridian IVR system
- assign applications to Meridian IVR voice channels
- start or stop applications

Integration

Functional integration permits integrated solutions for IVR processes. For example, ANI/DNIS information from the Meridian switch can be used to automatically retrieve information for playback to the caller, or to improve call detail logging.

Data connectivity

An account inquiry or transaction request must be completed via access to the appropriate information which usually resides in the database of a host computer. This requires a data host interface which can respond to the inquiry or request by providing the appropriate data. The data is then converted into voice responses for playback to the caller.

Fax processing

Meridian IVR fax capability allows the development of applications that use fax processing as part of an IVR application. These applications can

- send a fax in the same IVR call, or schedule a fax for delivery
- receive a fax during the same IVR call

Voice processing

Voice processing handles such functions as

- storing and playing messages and IVR prompts to callers
- monitoring call progress
- tone detection

Telephony functions

Basic Meridian IVR telephony functions can be described as the following:

Answering

The first function (for an individual or a machine) is to answer the telephone. This requires physical and functional interfaces to the telephone network.

Interacting

The second requirement is the ability to “talk” to the caller using a prerecorded vocabulary designed to provide the necessary voice prompts and responses.

Listening

Next is the ability to “listen” to the caller as the caller responds to the prompts through their touch-tone keypad.

Call flow structuring

Finally, the entire telephone call must take place within a logical predefined manner. The term for this conversation framework is “call flow.” Along with this is the “call script,” which provides the actual sequence of verbal prompts and responses.

The Meridian IVR system

Meridian IVR Release 2.0/I is the second release of Nortel’s Interactive Voice Response system. Release 2.0/I is based on the Meridian Mail (Release 8 and above) voice processing platform and an industry standard application processor (AP).

A unique feature specific to Nortel’s Meridian IVR system is its ability to interwork with Nortel’s Meridian Mail Voice Messaging and Call Centre applications.

Meridian IVR provides simultaneous support of multiple voice applications. This system can support a wide range of applications, communication interfaces, and multilingual language capability. It can also provide a scaleable, modular product family that addresses a range of configurations and options.

Integrated solutions

Customer demand for integrated solutions is increasing. Nortel’s research and development is focused on switch-integrated products and is sensitive to the needs of telecom and Call Center managers who require integrated solutions.

The IVR market can be separated into “stand-alone IVR” and “integrated IVR.” Stand-alone IVR systems are switch-attached (PBX or CO) but physically separate. Within the stand-alone IVR market, there are many inexpensive, low-end, PC-based solutions (typically using Dialogic cards).

Integrated IVR systems are part of a broader platform such as the switch itself, a voice mail system, Call Center systems, or the host computer. Functional integration permits integrated OA&M and interworking between applications. For example, ANI/DNIS information from the switch can be used to automatically retrieve information for playback to the caller or to improve call detail logging. Call ID can be used to track calls between IVR and live agent queues. Meridian IVR can utilize other capabilities of the platform such as fax or voice mail.

Call Center

Nortel, with its complete set of Meridian Applications, pushes the limits of integrated systems by defining new levels of integrated functionality within the Call Center.

Organizations that have tried stand-alone IVR systems and have identified more advanced needs are beginning to look for strategic platforms to support multiple application requirements. Flexible port sharing between IVR, fax processing, voice mail, automated attendant services, common maintenance, and administration result in cost-effective solutions. For premier account customers in particular, large port capacity and high reliability are important requirements.

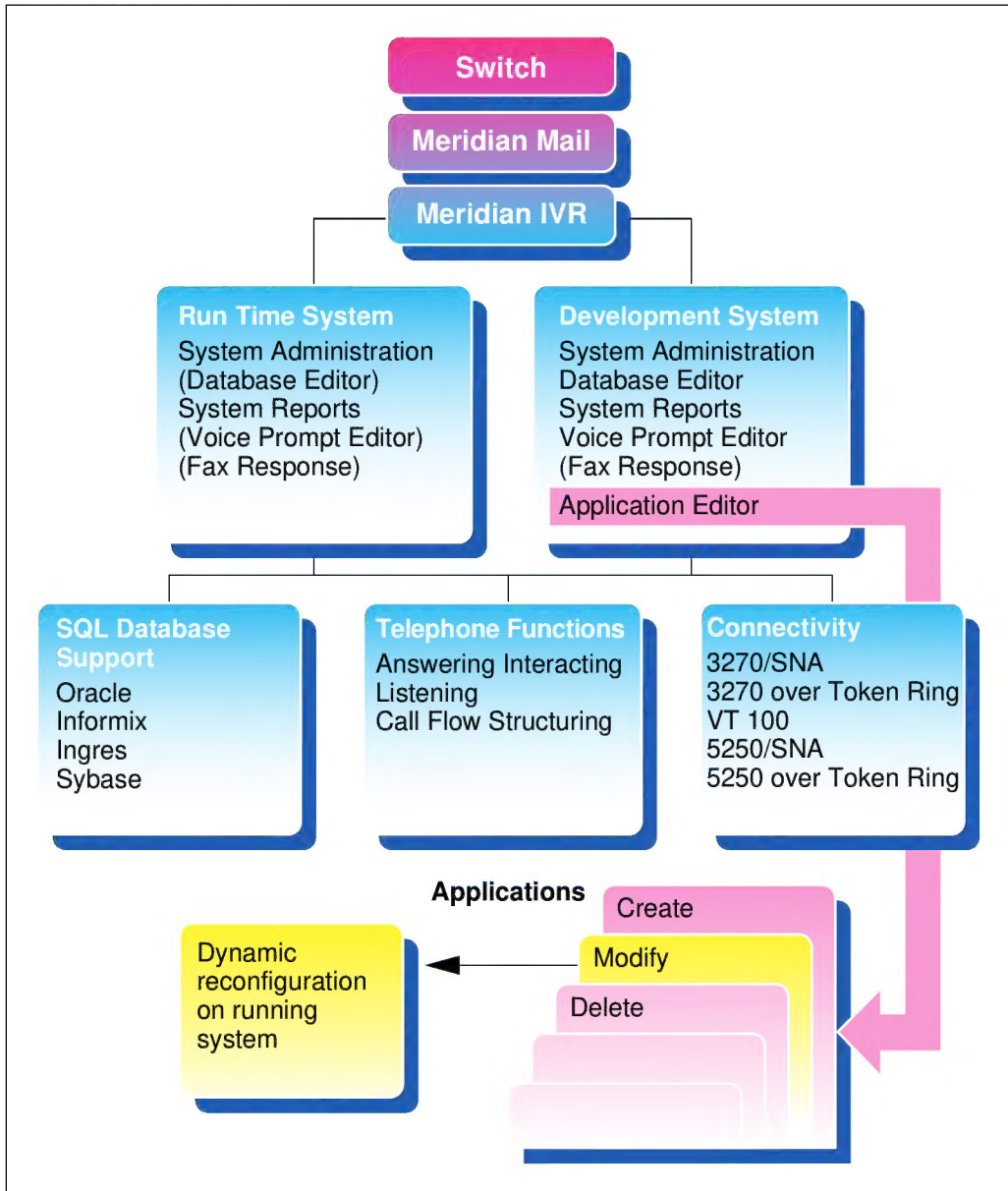
The Nortel focus is on an integrated IVR product as part of its Meridian IVR portfolio. With its strengths in comprehensive systems integration, Nortel is especially well positioned to address the integrated IVR market due to the added value of the multiple dimensions of integration.

Integrated IVR builds on the investment that Nortel has made in the Meridian Mail platform and dovetails with Nortel's Call Center products (Meridian MAX, Meridian CCR, and Meridian Link).

Meridian IVR components

Figure 1-1 provides an overview of the hardware and software components that make up a Meridian IVR system.

Figure 1-1
Meridian IVR overview



Meridian IVR Application Processor

The Application Processor (AP) is a self-contained unit providing basic IVR processing functions. The application processor, which runs on the SCO UNIX operating system, is a separate unit connected to Meridian Mail via an ACCESS link.

The application processor consists of hardware and software and is designed to work with Nortel's Meridian Mail voice processing system to provide IVR services.

All capabilities offered in Meridian IVR Release 1.2 will continue to be supported in Release 2.0/I with no regression in functionality or ease of use.

Hardware

The Meridian IVR AP uses Intel's new generation 64-bit Pentium™ microprocessors. The platform is designed to scale for any Intel 32-bit or 64-bit processor ranging from 60 MHz to 120 MHz. Meridian IVR 2.0/I supports a 75 MHz or 100 MHz processor. Other components include

- multiple communication ports
- onboard Super VGA Video Controller
- PS/2-style keyboard and mouse connectors
- SCSI hard drive
- floppy disk drive
- tape storage
- power supply
- 8-port serial card
- external modem

Optional items include host database connectivity cards, an Ethernet network interface card, a Token Ring network interface card, up to two 4-port fax cards, a second 8-port serial card, a second hard drive for the optional Fax response, a 14-inch or 17-inch monitor, and an integrated intelligent UPS.

Software

Meridian IVR software regulates general IVR functioning and also provides users with tools to create their own application call flows.

The Application Generator software is the key component of Meridian IVR that provides the various facilities necessary to develop and deploy voice applications.

Nortel's Meridian ACCESS Release 2 software is used to connect Meridian IVR to Meridian Mail.

Media server connectivity

This is Nortel's voice processing system. Meridian IVR uses the Meridian Mail platform as its media server. Meridian Mail Release 8 and above provides the voice processing component of Meridian IVR Release 2.0/I and handles such functions as

- storing and playing messages and IVR prompts to callers
- monitoring call progress
- tone detection
- switch integration

Figure 1-2
Meridian IVR equipment layout

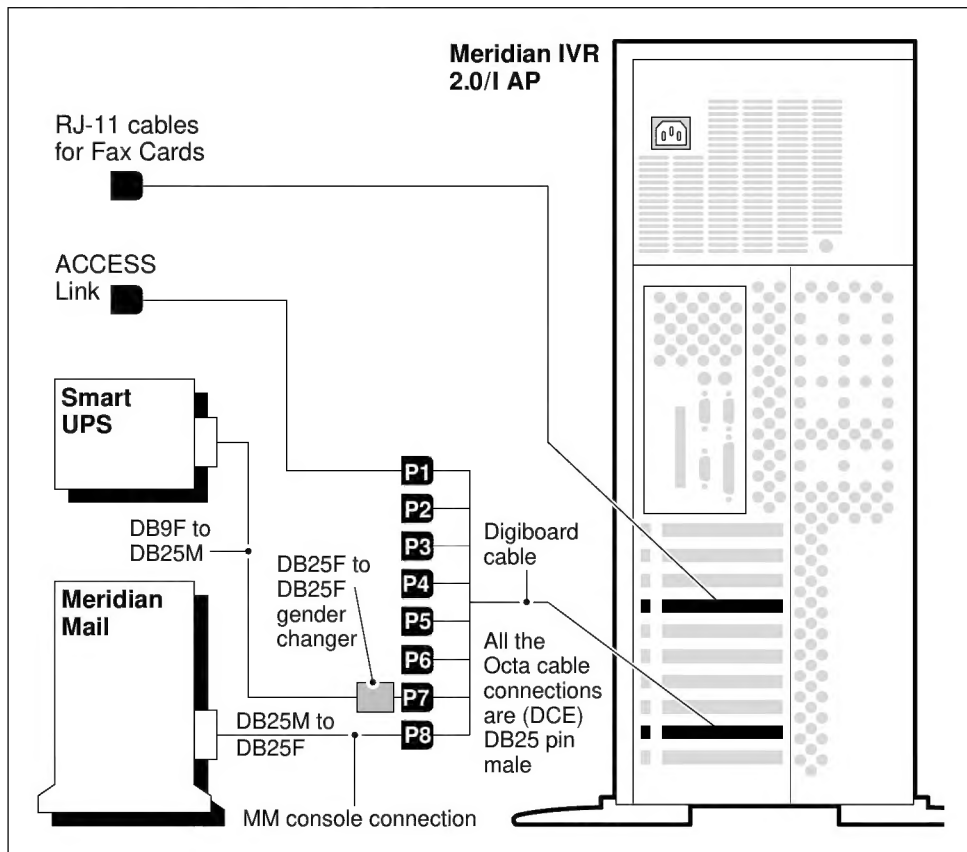
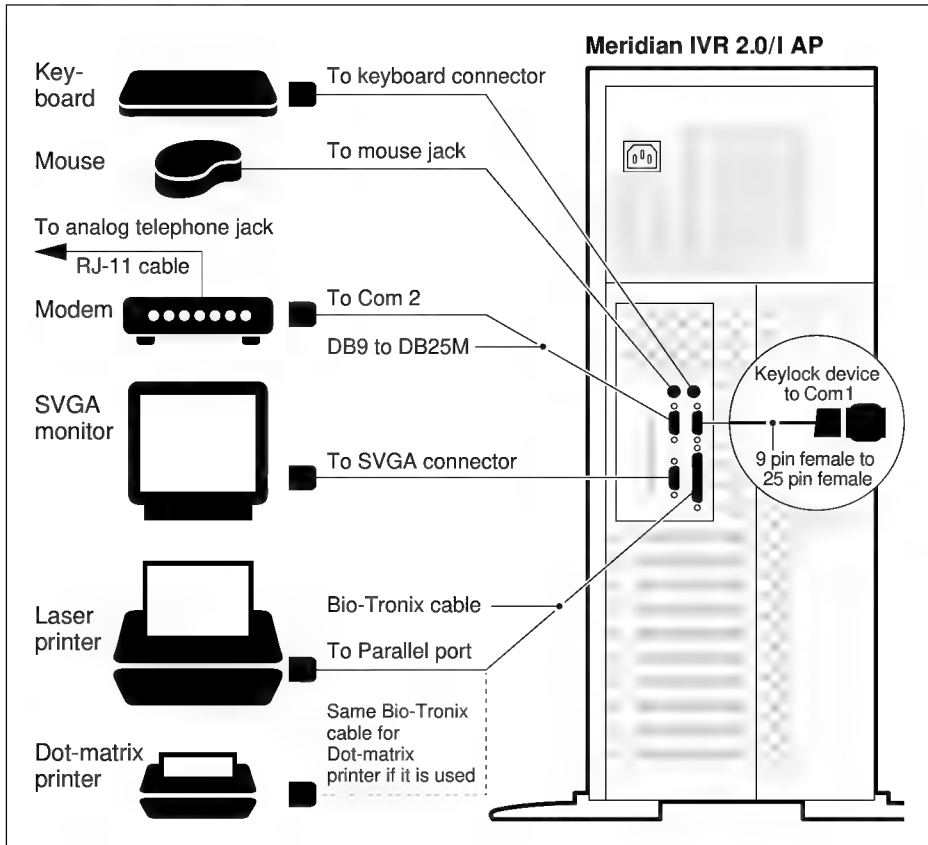


Figure 1-3
Meridian IVR peripherals



In Figure 1-2 and Figure 1-3, note the following components:

- the application processor, the platform from which application development is done using a graphical user interface
All Meridian IVR system administration functions are carried out from the application processor.
- the Meridian Mail media server
- the printer, used for printing call flows and reports
- the UPS, used for protection against power interruptions
- the external modem, used for remote support

Meridian IVR media server connectivity

Figure 1-2 illustrates the connectivity from the Meridian 1 switch to Meridian Mail, and to Meridian IVR when the caller dials into the system.

Meridian Mail provides the voice processing capability of the system via its voice channels.

Meridian IVR provides the application logic. For each voice channel on Meridian Mail, there may be a logical call on the Meridian IVR platform that will service calls arriving on that channel.

The maximum number of calls that a Meridian IVR application processor (AP) can service simultaneously is determined by the following:

- processor speed
- local SQL database size
- memory (RAM)
- complexity of the applications running on the system
- the capacity of the Meridian Mail system (that is, the number of physical ports)
- the capacity of the Meridian IVR system (that is, the number of logical channels)
- the number of Meridian Mail ports configured for Meridian IVR applications
- the number of fax ports configured on the IVR system

Meridian IVR platforms

Two distinct Meridian IVR Release 2.0/I platforms are supported:

- The Development system provides the capability to develop, modify, and run applications.
- The Run-Time system only allows a previously developed application to run on the Meridian IVR system.

Development system

The Development system enables the user to develop and run applications.

By means of the application processor, Meridian IVR provides users with a special graphical user interface (GUI). Tasks that can be performed via the GUI include application development, system configuration, application management, and report generation. The application processor may also function with a remote console, allowing certain maintenance tasks to be performed through a dial-up modem.

The main menu appears whenever you log on to Meridian IVR (see Figure 1-4). Each icon in the menu represents a specific area of Meridian IVR administration or development tasks. For example, the first icon shown (the computer tower) allows general system administration activities to be carried out. Clicking the mouse on the other icons permits report generation, database creation, maintenance, and so on.

Figure 1-4
The Meridian IVR main menu



Meridian IVR's GUI-based application development environment offers a special advantage to the application developer.

When an application has been created, a printout of the "call flow" for that application can be easily generated by the developer. Meridian IVR formats the call flow diagram automatically and includes information about the content of each "cell," or step, of the call flow. The developer merely requests a call flow file for the desired application. Meridian IVR creates the entire file which the developer may then print out.

For the customer who wants to see a clear picture of the intended application call flow, or who needs to keep a detailed record of how the application works, Meridian IVR's ability to produce a comprehensive diagram of an application call flow is extremely useful.

Run-Time system

The Run-Time system is a full-featured version of Meridian IVR that does not include the Application Editor (XAE). The attendant Database Editor and Voice Prompt Editor (VPE) are optionally available on the Run-Time system. With this exception, all other functionality and features are identical for both systems.

The application processor used by the Run-Time system provides users with the same special graphical user interface (GUI) as the Development system. Tasks that can be performed via the GUI include system configuration, application management, report generation, and, optionally, database and voice prompt editing.

The Run-time system does not demand the use of a 17-inch SVGA monitor or a laser printer; a 14-inch SVGA monitor and a Dot Matrix printer may be substituted for economy. However, the 17-inch monitor and/or the laser printer can be used on the Run-Time system if so desired.

Meridian IVR applications

Meridian IVR utilizes application packages for specific horizontal and vertical industries. Applications are created by designing them and testing them on the Development version of Meridian IVR. Once they are tested, they can be installed on Meridian IVR and put to work. Organizations and businesses that purchase the Run-Time version of Meridian IVR must acquire applications from Value Added Developers (VADs) for use on their systems. Standard applications can be customized to suit any business need.

These application packages can be developed easily and quickly. Application creation and customization is driven both by the necessity of adapting to unique host screen layouts, and product or service terminology (reflected in voice prompts), and by the opportunity to be uniquely different from competitors. The challenge of cost-effective customization is met with high-level tools to streamline the sales cycle and a support infrastructure (including application specialists and Value Added Developers) that can apply these tools to deliver custom solutions.

Nortel offers off-the-shelf generic applications for selected industries which are easy to demonstrate, install, and customize, delivering total system solutions profitably. Standard applications provide a generic, packaged model for a specific vertical or horizontal application (for example, telebanking, order entry, flight arrivals/departures, and emergency outcalling) which can then be easily adapted to address individual customer requirements. Value Added Developers can also provide these packaged applications.

Business solutions via generic application platforms are created for

- Vertical markets
 - health care
 - banking
 - human resources
- Horizontal markets
 - new host interfaces

Meridian IVR tools

Meridian IVR starts automatically when you power on or reset your Meridian IVR system. Once you log in to the Meridian IVR system, the GUI window (on the desktop) appears (see Figure 1-4). By using the icons in this main menu, you can access the six basic tools for developing and managing applications:

- the System Administration tool for operating and administering the system
- the Database Editor tool for creating information databases (optional for Run-Time systems)
- the System Reports tool for generating reports
- the Application Editor tool for developing applications (Development system only)
- the Voice Prompt Editor for managing prompts (optional for Run-Time systems)
- online help
- If the Fax Response option is installed, the Fax Response main menu is presented for managing the Fax system.

The System Administration tool

The System Administration tool is a menu-driven tool for configuring and controlling your Meridian IVR system. Using this tool, you can

- configure the Meridian IVR system
- assign applications to Meridian IVR voice channels
- start or stop applications
- close the Meridian IVR main menu window

Meridian IVR has the power to run many different applications at the same time. Each application can be assigned to multiple Meridian IVR voice channels. Multiple applications can be run simultaneously, and applications can be started and stopped independently of each other. Consequently, you can update your applications as often as you like without ever losing a call on the other applications.

Refer to the *Meridian IVR System Administration Guide* (NTP 555-9001-300) for a detailed description of using the administration tool.

The Database Editor tool

Meridian IVR supports use of the Database Editor (optional on Run-Time systems) to store data such as names, addresses, and telephone numbers of customers who use an order entry application. You can use the Database Editor, which is menu-driven, to set up an information database for use with your applications.

Each information database consists of a series of records and can be connected to your applications or used separately. For example, an application can look up a specific record and then use this information within the application. Any changes made to this information can be written to the database.

Refer to the *Meridian IVR Application Development Guide* (NTP 555-9001-310) for a detailed description of using the Database Editor.

The System Reports tool

By using the System Reports tool, you can gather information about all of the activity in the system. You can easily find out how many calls have been received by day, hour of day, and channel. You can also monitor what is happening to any or all of the channels controlled by your applications module. Reports can be displayed or printed if you prefer.

Refer to the *Meridian IVR System Administration Guide* (NTP 555-9001-300), for a detailed description of the System Reports tool.

The Application Editor tool

The Application Editor tool is specific to the Development system. It is directly accessible from the Meridian IVR main menu. The Application Editor simplifies application development since you can see the design of your call flow as you draw it directly on a drawing board. When the application call flow is completed, it is an executable file ready to be loaded and run, or printed (documented).

All applications are constructed as a series of cells linked together to form the application. For each cell type, parameters can specify exactly how the cell will perform its functions. Each cell can be connected to other cells based on the results of the cell's operation. In this way, the program is represented in a pictorial form that is easy to understand.

This approach to basic application building requires minimal coding skills; the developer simply picks an action, optionally adjusts modifiers associated with the action, and then makes the logical connections between the actions to complete the application.

If developers require functions that are not available via the cells, they can write user functions in 'C' programming language to provide for any specialized functionality.

Refer to the *Meridian IVR Application Development Guide* (NTP 555-9001-310) for a detailed description of using the Application Editor.

The Voice Prompt Editor tool

This tool is optional on Run-Time systems. Meridian IVR makes it easy for you to record, distribute, and update the prompts that guide callers through your applications. You can access the Voice Prompt Editor to create prompts on Meridian Mail for use with applications that will run on Meridian IVR.

Procedures for using the Voice Prompt Editor are discussed in the *Meridian IVR System Administration Guide* (NTP 555-9001-300).

The Fax Response tool

Meridian IVR supports use of an optional Fax Response tool. The Fax Response option provides users with send and receive fax capability through the Meridian IVR session.

Meridian IVR Fax Response uses the graphic user interface (GUI) on the Meridian IVR palette for all fax functions. The Fax Response tool uses a separate set of icons (from the application processor) for all fax functions. These icons are accessed from the Fax Response main menu.

Fax Response capabilities include

- integration with interactive voice functions
- sending or receiving a multi-page fax to or from another fax device
- converting ASCII data to fax-ready format with a selection of fonts and character sizes
- converting Postscript data to fax-ready format with the “standard” 35 fonts found in most Postscript printers
- converting TIFF data to fax-ready format
- integration with host connectivity on Meridian IVR
- integration with system/SQL database on Meridian IVR
- overlaying data (for example, text, signature, logo, and so on) onto fax data
- fax view and edit capability